

I. REMARKS

Preliminary Remarks

Claims 1 to 10 are pending of which claims 1 and 9 are independent. No claims are amended, withdrawn, added, or canceled as a result of this response. The applicants thank the examiner for the indication that claim 8 is allowable.

The applicants respectfully request entry of this response under 37 U.S.C. §1.116 in that if the examiner maintains the claim rejections, this response places the application in better form for consideration on appeal. This response is filed within the shortened statutory period for response, no fee due. The applicants respectfully request reconsideration and allowance of the present application.

Patentability Remarks

Rejection under 35 U.S.C. §102 –

Claims 1 to 4, 9, and 10 were rejected under 35 U.S.C. §102(b) as being anticipated by Klug et al. (U.S. Pat. Nos. 5,605,882; 5,648,016; or 5,779,931). The applicants respectfully traverse in view of the succeeding remarks.

The examiner's bases for the rejection appears to be:

- 1) patentees disclose azeotropic compositions and their use as blowing agents for polyurethane foams, wherein compositions that correspond to applicants' compositions are disclosed;
- 2) since azeotropic compositions are disclosed, applicants' percent compositions are considered to be inherently met by the references;
- 3) the formulas within the abstract and the specification encompass the claimed fluoroether blowing agent and the claimed fluorocarbon blowing agents; and
- 4) contrary to applicant's assertion, the teachings of the references are not limited to specifically recited compounds recited within the references.

The applicants note that independent claim 1 is directed to a process for foaming polyurethanes, comprising adding to compositions used to make solid polymers azeotropic or near azeotropic foaming agent compositions as substitutes for CFC 11 to

give a homogeneous foam having density of about 30 Kg/cm³, the compositions selected from the group consisting of IV) and V).

Compositions IV) and V) both contain as hydrofluoroether "HCF₂OCF₂OCF₂H" and as hydrofluorocarbon "CF₃CH₂CF₂CH₃" (composition IV)) and "CF₃CH₂CH₂CF₃" (composition V)), respectively. Independent claim 9 is directed to polyurethane polymer foaming compositions comprising, as blowing agent substitutes of CFC 11 to give a homogeneous foam having density of about 30 Kg/cm³, the compositions selected from the group consisting of IV) and V).

With respect to the first basis of the rejection, the applicants note that no where in any of the Klug *et al.* patents is a process for foaming polyurethanes disclosed, the process comprising adding to compositions used to make solid polymers azeotropic or near azeotropic foaming agent compositions, as substitutes for CFC 11, to give a homogeneous foam having density of about 30 Kg/cm³. U.S. Pat. No. 5,779,931 at column 84, line 21 states that the compositions can be used as expansions agents for polyolefins and polyurethanes. However, this patent does not disclose which compositions can be used as substitutes of CFC 11 to expand polyurethanes to give an homogeneous foam having density of about 30 Kg/cm³, in the same conditions used to make a polyurethane foam using CFC 11.

U.S. Pat. No. 5,779,931 also does not disclose compositions IV) and V) as claimed. The abstract discloses compositions of at least one hydrofluoroether and at least one hydrofluorocarbon having the following general formulas:

- for the hydrofluoroether: C_aF_bH_{2a+2-b}O_c
wherein a = 2 or 3, b is between 3 and 8, c is 1 or 2; and
- for the hydrofluorocarbon: C_nF_mH_{2n+2-m}
wherein n is between 1 and 4, m is between 1 and 8.

The applicants have already shown that the above general formulas are not sufficient to inform one of ordinary skilled in the art of the blowing agent compositions claimed. The Declaration of Dr. Basile, which the applicants previously submitted on August 17, 2005, shows that in the hydrofluoroethers and hydrofluorocarbons of the following compositions are covered by the general formulas of Klug *et al.* above:

Example 6:

- hydrofluoroether: CHF_2OCF_3 (125E)
- hydrofluorocarbon: CH_2F_2 (HFC32)

Example 7:

- hydrofluoroether: CF_3OCF_3 (116E)
- hydrofluorocarbon: CH_2F_3 (HFC125)

However, the Declaration shows that even though these hydrofluoroethers and hydrofluorocarbons are covered by the general formulas of Klug et al., the compositions of Examples 6 and 7 cannot be used as foaming agent compositions as substitutes for CFC 11 to give a homogeneous foam having density of about 30 Kg/cm³. Indeed, in the same conditions in which CFC 11 forms homogeneous polyurethane foams having about the above-indicated density, the compositions of Examples 6 and 7 do not expand at all. Therefore these compositions have been found to be inoperative when used as blowing agents in the same conditions of CFC 11.

The Declaration of Dr. Basile also shows that the following composition of a hydrofluoroether and a hydrofluorocarbon:

Example 1:

- hydrofluoroether: $\text{CHF}_2\text{OCHF}_2$ (134E)
- hydrofluorocarbon: $\text{CF}_2\text{CHFCHF}_2$ (HFC236ea)

when used as a blowing agent to expand a polyurethane in the same conditions used for the blowing agent CFC 11, forms a completely expanded foam that is not homogeneous and has a density of 40 Kg/m³. This density is higher than that of the foam obtained with CFC 11.

Therefore, although the formulas of the components of the compositions of Examples 1, 6 and 7 of the Declaration are covered by the corresponding general formulas of Klug et al., they cannot be made into polyurethane foams in the same conditions used for CFC 11. In other words, none of the Klug et al. patents disclose the process of claim 1 since only selected compositions of a hydrofluoroether and a hydrofluorocarbon can be used to substitute CFC 11.

With respect to the second basis of the rejection, the common feature of the compositions of the Klug *et al.* patents, *i.e.*, being azeotropic, does not direct one of ordinary skill in the art to select which ones could be useful as substitutes of CFC 11, as shown by the applicants in the Declaration of Dr. Basile.

With respect to the third basis of the rejection, the issue is not that of the formulas encompassing the fluoroether and the fluorocarbon used in the compositions of claim 1. Rather, the issue is to establish whether the abstract and specification of the Klug *et al.* patents disclose the compositions of the present invention. The hydrofluoroether of compositions IV) and V) of claim 1 is identified as 236caE.

This hydrofluoroether is used in three compositions of Table I in U.S. Pat. No. 5,779,931 (column 10, lines 60 to 65) respectively with the following fluorocarbons:

- HFC 143 (1,1,2 trifluoroethane - see column 5, lines 44 to 45)
- HFC 254ca (1,2,2,3 tetrafluoropropane - see column 5, lines 54 to 55)
- HFC 245ca (1,1,2,2,3 pentafluoropropane - see column 5, lines 50 to 51)

None of the Klug *et al.* patents describe any other compositions containing 236caE. Indeed, the examiner is also not able to indicate in which part of the specification of the Klug *et al.* patents the specific compositions of present claim 1 are disclosed.

As to the fourth basis of the rejection, for anticipation, the cited reference(s) must disclose the subject matter of the claim. In this situation, the Klug *et al.* patents must disclose the process claimed. There is, however, no disclosure of the process claimed in any of the Klug *et al.* patents, because they neither mention CFC 11, nor that the azeotropic compositions can be used to form polyurethane foams in the same conditions wherein the blowing agent CFC 11 is used.

Therefore, because none of the Klug *et al.* patents discloses the compositions IV) and V) of the claimed invention, the applicants respectfully submit that claims 1 to 4, 9, and 10 are not anticipated by the Klug *et al.* patents and respectfully request withdrawal of this rejection.

Rejection under 35 U.S.C. §103 –

Claims 5 to 7 were rejected under 35 U.S.C. §103(a) as being unpatentable over Klug *et al.* (U.S. Pat. Nos. 5,605,882; 5,648,016; or 5,779,931) in view of Barthelemy *et*

al. (U.S. Pat. No. 5,304,320). The applicants respectfully traverse in view of the succeeding remarks.

The examiner's bases for the rejection appear to be the following:

- the Klug *et al.* patents disclose azeotropic compositions and their use as blowing agents for polyurethane foams, wherein compositions that corresponds to applicants' compositions are disclosed.
- while the Klug *et al.* patents are silent regarding the use of additional blowing agents, such as water or carbon dioxide, within polyurethane foam formulations, the use of water in combination with fluoroether azeotropes as blowing agents for polyurethane foams was known at the time of the invention.

Claims 5 to 7 are dependent on claim 1. There is no suggestion or motivation in any of the Klug *et al.* patents to select the claimed compositions in order to solve the technical problem of the present invention, because the technical problem is neither disclosed nor suggested in these patents. Barthelemy *et al.* do not overcome the deficiencies of any of the Klug *et al.* patents. Therefore, the combination of the Klug *et al.* patents with Barthelemy *et al.* does not render obvious claims 5 to 7 and the applicants respectfully request withdrawal of this rejection.

II. CONCLUSION

In view of the preceding remarks, the applicants respectfully submit that this application is in condition for allowance and request favorable action thereon.

In the event this response is not timely filed, the applicants hereby petition for an appropriate extension of time. The fee for this extension, along with any additional fees required with respect to this response, may be charged to Deposit Account No. 01-2300, referencing Attorney Docket No. 108910-00123.

Respectfully submitted,

AREN'T Fox PLLC



Gautam Prakash, Ph.D.
Registration No.: 53,481
Direct Telephone No.: 202-857-6057

Customer No.: **004372**

1050 Connecticut Avenue, N.W.
Washington, D.C. 20036-5339

Telephone No.: 202-857-6000
Facsimile No.: 202-857-6395

/GP